

KUMHO 1502

Emulsion Styrene Butadiene Rubber (ESBR)

Product Introduction

- KUMHO SBR is a synthetic rubber product manufactured by the cold emulsion polymerization of styrene and butadiene.
- It provides excellent uniformity compared with natural rubber.
- It is classified by the applied emulsifier and stabilizer.

Product Properties

Property	Typical value	Test Method
Bound Styrene (%)	22.5 - 24.5	ASTM D5775
RAW MV(ML1+4, 100 °C)	47 - 57	ASTM D 1646
Organic Acid (%)	4.80 - 7.00	ASTM D5774
Soap Content (%)	Max 0.50	ASTM D5774
Oil Content (%)	-	ASTM D 5774
Emulsifier	Mixed Soap of Rosin Acid and Fatty Acid	

Characteristics and Applications

- Typical application is for tire tread by mixing with NR, BR and any other rubber.
- Compatible with carbon black, making it widely used for tires, shoes, and industrial goods.
- Its extrusion properties exceed those of natural rubber and stocks have less tendency to scorch in processing.

Manufacturer location

- Ulsan in Republic of KOREA

Product safety

- Relevant safety data and references can be found in the safety data sheet.

Shelf life/Conditions

- 1 years from the production date at temperatures not exceeding 35 °C, keeping away from direct sunlight, humidity

Packaging

- Bale weight : 35 kg (Wrapped by polyethylene film)
- Box weight : 1,050 kg (30 bales)

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| Typical Properties |

Typical Properties													Typical Properties																					
Item \ Grade	1500	1500NF	1500M	1500S	1502LL	1502	1502W	1502NF	1502G	1507L	1507	1507H	1712P	1712L	1712C	1712	1712H	1712G	1712NF	1721	1778K	1723L	1723C	1723	1723G	1739	1745T	1763	1769	1783	1789	1793	1799	
Bound Styrene(%)																				40.0	23.5	23.5	23.5	23.5	23.5	40.0	45.0	23.5	40.0	23.5	40.0	23.5	40.0	
Extender oil	Type	-											Paraffinic	Aromatic						Naphthenic	TDAE						Heavy		RAE		T-RAE			
	PHR												37.5						37.5						37.5									
Raw MV (ML ₁₊₄ , 100 ?)																					46	35	44	49	49	54	70	49	54	49	54	49	54	
Stabilizer		Staining			Non-Staining								Staining						Non-Staining	Staining														
Emulsifier		Rosin Soap				Mixed Soap of Rosin Acid and Fatty Acid																												
Coagulant		Salt-Acid																																
Specific Gravity		0.93	0.93	0.93	0.93	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.91	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.92	0.95	0.95	0.95	0.95	0.97	0.97	0.95	0.97	0.95	0.97	0.95	0.97	
Compound Properties																																		
Compound MV (ML ₁₊₄ , 100 ?)		82 ^{*1)}	81 ^{*1)}	80 ^{*1)}	81 ^{*1)}	75 ^{*1)}	80 ^{*1)}	80 ^{*1)}	80 ^{*1)}	80 ^{*1)}	60 ^{*1)}	64 ^{*1)}	71 ^{*1)}	60 ^{*2)}	52 ^{*2)}	59 ^{*2)}	63 ^{*2)}	65 ^{*2)}	66 ^{*2)}	63 ^{*2)}	68 ^{*2)}	57 ^{*2)}	52 ^{*2)}	59 ^{*2)}	63 ^{*2)}	66 ^{*2)}	68 ^{*2)}	77 ^{*2)}	63 ^{*2)}	68 ^{*2)}	63 ^{*2)}	68 ^{*2)}	63 ^{*2)}	68 ^{*2)}
Rheometer (160 ? ,ARC ± 1)																																		
ML (lbf.in)		15.1	15.5	15.5	15.6	14.3	15.4	15.7	15.7	15.6	11.7	12.3	12.8	12.0	11.1	12.3	13.5	13.6	13.6	13.8	12.7	13.5	11.5	12.4	12.1	12.0	12.0	13.0	12.0	11.8	12.1	12.1	12.1	12.1
MH (lbf.in)		49.8	50.3	50.3	49.2	49.6	51.7	51.5	50.2	51.4	47.6	47.9	47.6	35.3	34.7	35.6	37.0	37.4	37.7	37.7	35.5	36.0	35.4	36.3	37.3	37.3	35.4	35.3	36.2	35.7	34.5	36.3	35.9	35.0
ts 1 (Min.)		4.8	4.9	5.3	5.1	4.4	4.5	4.5	4.3	4.3	4.7	4.2	4.7	5.1	5.9	6.3	5.8	6.1	5.7	6.0	6.5	5.7	6.3	6.4	6.1	6.1	7.1	6.3	7.1	7.4	6.2	7.5	6.2	7.5
T'50 (Min.)		12.8	10.9	12.1	11.3	10.5	9.5	10.1	10.3	10.7	11.6	10.6	11.6	9.9	10.2	10.6	9.9	10.7	10.2	10.8	11.3	11.3	12.1	12.4	12.1	12.2	12.3	11.9	12.4	13.4	11.7	12.0	12.5	13.3
T'90 (Min.) ^{*3)}		22.0	19.4	21.1	20.1	19.5	18.0	19.5	19.3	19.5	20.6	19.5	20.6	17.3	17.6	18.4	17.2	18.3	17.7	17.9	19.0	20.0	19.4	19.9	19.3	19.3	20.3	19.7	20.6	22.3	20.2	21.3	20.2	21.5
300% Modulus (kgf/ cm ²)		167	164	160	161	185	206	190	187	186	167	172	183	130	102	104	108	110	110	106	108	129	110	111	115	108	115	123	102	110	105	110	110	112
Tensile Strength (kgf/ cm ²)		300	298	297	305	293	300	297	298	286	279	284	290	230	233	232	243	243	251	240	240	221	235	235	245	242	250	245	221	240	250	260	240	249
Elongation (%)		500	500	500	510	430	410	440	450	450	470	470	460	550	590	570	580	570	570	590	600	460	570	570	560	510	590	550	590	620	610	620	590	620
Hardness (Shore-A)		72	72	72	72	72	72	72	72	72	71	71	71	60	63	63	63	63	63	63	65	60	62	61	62	62	64	70	63	64	63	66	63	64

*1) SBR 100, ZnO 3, S/A 1, HAF Black (IRB#8) 50, Accelerator TBBS 1.00, Sulfur 1.75 Total : 156.75

*2) SBR 137.5, ZnO 3, S/A 1, HAF Black (IRB#8) 68.75, Accelerator TBBS 1.38, Sulfur 1.75 Total : 213.38

*3) 145 ? ×35Min., Press Vulcanization

NOTE) The above data are typical value; therefore, they may differ slightly from the physical properties of the supplied product.